

10/535 139**- 1 - JC13 Rec'd PCT/PTO 17 MAY 2009**PCT/EP03/13177
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F38786WO HS/kij/aj/tge**Patent Claims**

- 5 1. Ratio regulating mechanism for a manually actuated action lever, in particular for the use in a motor vehicle, comprising:
- a. a mounting (2);
- 10 b. an action lever arm (20);
- c. a rotational shaft (15) for rotably mounting of the action lever arm (20) at the mounting (2), wherein the rotational shaft (15) is relocatably mounted at the action lever arm (20) and relocatably mounted at the mounting (2);
- 15 d. a first adjustment means (19, 21) for the relocation of the rotational shaft (15) in relation to the action lever arm (20); and
- e. a second adjustment means (22, 23) for the relocation of the rotational shaft (15) in relation to the mounting (2),
- 20 f. the action lever arm (20) comprising an elongated guide (17) and the mounting (2) comprising an elongated guide (18) for the relocatable mounting of the rotational shaft (15),
- 25 g. wherein the first adjustment means (19, 21) comprises an arm shaft (19), which is supported in the action lever arm (20), and first cam plates (21), which are connected to the arm shaft (19) and the rotational shaft (15), so that a relocation of the rotational shaft (15) in relation to the action lever

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arm (20) results from an adjustment-rotation of the first cam plates (21),
and

- h. wherein the second adjustment means (22, 23) comprises a support pin
5 (23), which is connected to the mounting (2), and second cam plates (22),
which are connected to the support pin (23) and the rotational shaft (15),
so that a relocation of the rotational shaft (15) in relation to the mounting
(2) results from an adjustment-rotation of the second cam plates (22).
- 10 2. Ratio regulating mechanism in accordance with claim 1, wherein the first ad-
justment means (19, 21) and the second adjustment means (22, 23) are adjust-
able, so that during the relocation of the rotational shaft (15) the position of
the action lever arm (20) in relation to the mounting (2) is maintained.
- 15 3. Ratio regulating mechanism in accordance with one of the claims 1 or 2,
wherein the relocation of the rotational shaft (15) by said first adjustment
means (19, 21) occurs in an opposite direction to the relocation of the rota-
tional shaft (15) by said second adjustment means (22, 23).
- 20 4. Ratio regulating mechanism in accordance with one of the claims 1 to 3,
wherein said first adjustment means (19, 21) and said second adjustment
means (22, 23) are simultaneously actuated.
5. Ratio regulating mechanism in accordance with one of the claims 1 to 4,
25 wherein the first cam plates (21) comprise first cam slots (21a), through which
the rotational shaft (15) extends, and the second cam plates (22) comprise sec-
ond cam slots (22a), through which the support pin (23) extends.
6. Ratio regulating mechanism in accordance with claim 5, wherein said rota-
30 tional shaft (15) is attached to said second cam plates (22) and slideably ar-

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ranged through said first cam slots (21a), so that the rotational shaft (15) is functional connected to both adjustment means (19, 21, 22, 23).

- 5 7. Ratio regulating mechanism in accordance with one of the claims 5 or 6, wherein the first and the second cam slots (21a, 22a) have substantially the same shape and length.
- 10 8. Ratio regulating mechanism in accordance with one of the claims 1 – 7, wherein the first and the second cam plates (21, 22) are rotated by the same rotation angle during adjustment of the rotational shaft (15).
- 15 9. Ratio regulating mechanism in accordance with one of the claims 1 - 8, wherein the first cam plates (21) and/or the second cam plates (22) are driven by means of an electric motor.
- 20 11. Ratio regulating mechanism in accordance with one of the claims 9 or 10, wherein the first cam plates (21) and/or the second cam plates (22) are driven either by means of a toothed wheel gearing, a spindle gearing, a cam gearing, a chain drive, a belt drive, or a V-belt drive, a flexible shaft or by a combination of said gearings.
- 25 12. Ratio regulating mechanism in accordance with one of the claims 1 - 11, wherein the ratio regulating mechanism is part of a hand-brake lever.
- 30 13. Ratio regulating mechanism in accordance with one of the claims 1 - 11, wherein the ratio regulating mechanism is part of a pedal, preferably of a pedal for a motor vehicle.

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14. Ratio regulating mechanism in accordance with claim 13, wherein the pedal is a pedal which can be adjusted in its dimensions to the user and wherein the action lever can be adjusted, so that the actuation force and the actuation path of the pedal remain constant despite the geometrical adjustment to the user.

15. Ratio regulating mechanism in accordance with claim 13, wherein the pedal is a pedal which can be adjusted in its dimensions to the user and wherein the action lever can be adjusted, so that the actuation force can be adjusted to the user.

16. Ratio regulating mechanism in accordance with one of the claims 14 or 15, wherein the rotational shaft (15) is independent from a geometrical adjustment means of the pedal.

17. Ratio regulating mechanism in accordance with one of the claims 13 - 16, wherein a common actuation means is used for geometrical adjustment of the pedal to the user and for actuation of the first (19, 21) and second adjustment means (22, 23).

18. Ratio regulating mechanism in accordance with claim 13 - 16, wherein at least two actuation means are used for geometrical adjustment of the pedal to the user and for actuation of the first (19, 21) and second adjustment means (22, 23), wherein the actuation means are controlled by a control electronics.

19. Ratio regulating mechanism in accordance with one of the claims 13 - 18, wherein at least two of the pedals are arranged to form a pedal unit, wherein the first (19, 21) and second adjustment means (22, 23) of the action levers can be jointly driven for joint adjustment.

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20. Ratio regulating mechanism in accordance with claim 19, wherein only a single, common actuation means is used for actuation of the first (19, 21) and second adjustment means (22, 23).

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